



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/619,479	07/19/2000	Shunpei Yamazaki	0756-2188	1883

7590 03/29/2004

Robinson Intellectual Property Law Office  
PMB 955  
21010 Southbank Stret  
Potomac Falls, VA 20165

EXAMINER

RUDE, TIMOTHY L

ART UNIT	PAPER NUMBER
----------	--------------

2871

DATE MAILED: 03/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/619,479

Applicant(s)

YAMAZAKI ET AL.

Examiner

Timothy L Rude

Art Unit

2871

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 24 December 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-25 and 29-37 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 10,11,21 and 22 is/are allowed.
- 6) ☒ Claim(s) 1-9,12-20,23-25 and 29-37 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Claims*

1. Claims 1, 4, 8, 12, 15, 19, and 23-25 are amended. Claims 26-28 are canceled.  
Claims 29-37 are added.

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

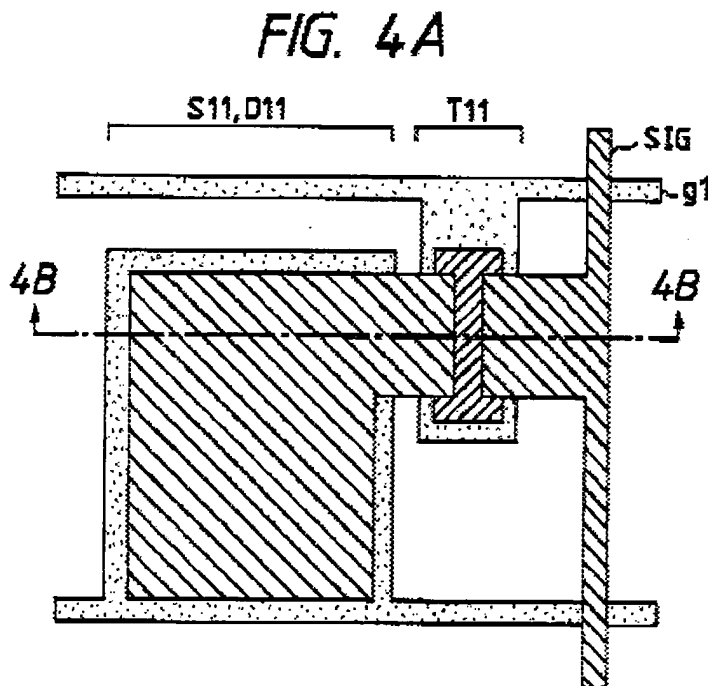
A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 2, 8, 12, 13, 19, 23, 25, 29, 31, 32, 34, 35, and 37 are rejected under 35 U.S.C. 102(b) as being anticipated by Kaifu et al (Kaifu) USPAT 5,812,109.

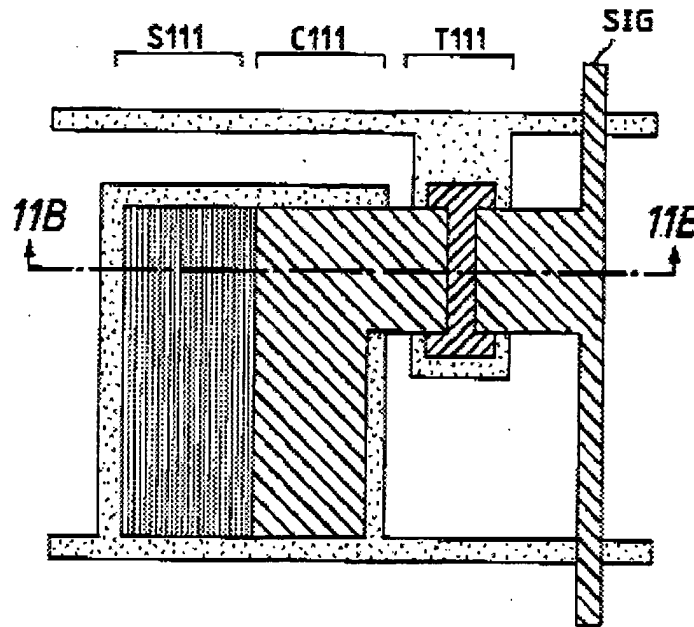
As to claims 1, 23, 25, and 29, Kaifu discloses an embodiment (col. 14, line 53 through col. 17, line 13) that is explained in part by Figures 3, 4A, and 4B, (col. 5, line 26 through col. 14, line 52) wherein an integral image recognition/display apparatus comprises: a plurality of pixel portions, D11, each having an active device, T11, and arranged in matrix and each having a pixel electrode (left portion in Figure 4B), comprising 10,000 angstrom thick layer of aluminum (Applicant's a reflecting material), 6, and n-doped silicon (Applicant's light-transmitting material), 5, (Applicant's pixel electrode comprises a first layer and a second layer, said second layer provided over

said first layer, one of said first layer and said second layer comprising a reflecting material (10,000 angstrom thick layer of aluminum) and the other comprising light-transmitting material (n-doped silicon)) over an active matrix substrate, 1; and a plurality of sensor portions, S11, arranged in matrix over said active matrix substrate, wherein said sensor portion includes a photo-electric conversion device, 4, and can read information by utilizing the rays of light transmitting through said light-transmitting material when an external image is read (Abstract), wherein said photo-electric conversion device, 4, overlaps the TFT (Applicant's active device).

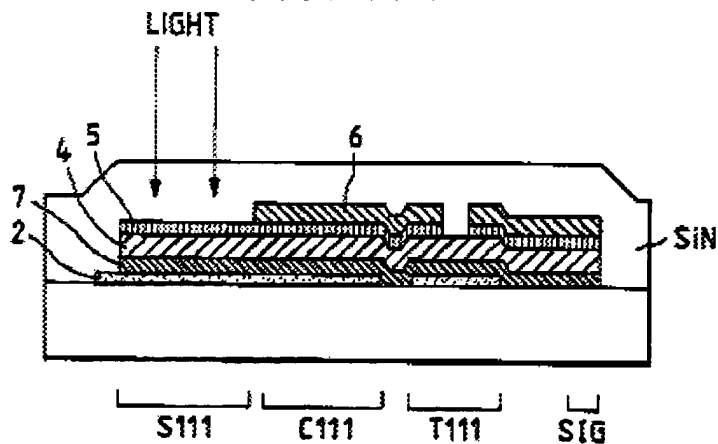




**FIG. 11A**



**FIG. 11B**



wherein said pixel electrode, 6, has an image display function (col. 11, line 66 through col. 12, line 10; see also incident light ray L2 and reflected light ray L3 in Figure 4B).

Please note: the difference between the embodiment of Figure 11B and that of Figures 4B is 11B performs the image input and display on the top side as opposed to 4B

performing the image input on the bottom side and the image display on the top side.

Please also note: in Figure 11B pixel electrode, 6, is energized for image display which also necessarily energizes transparent n-type silicon structure, 5, that functions as a transparent pixel electrode in the display mode.

As to claim 2, Kaifu discloses in Figure 4B the apparatus according to claim 1, wherein said active device comprises a bottom gate type TFT, T11.

As to claim 8, Kaifu discloses in Figures 3, 4A, and 4B, an integral image recognition/display apparatus comprising: a plurality of pixel portions, D11, each having an active device, T11, and arranged in matrix and each having a pixel electrode, (left portion in Figure 4B), comprising a reflecting material, 6, and a light-transmitting material, 5, over an active matrix substrate, 1; and a plurality of sensor portions, S11, arranged in matrix over said active matrix substrate, wherein said sensor portion has a photo-electric conversion device, 4, and at least a part of said photo-electric conversion device, 4, is extended in such a manner as to overlap with said active device, T11, wherein said pixel electrode, 6, has an image display function (col. 11, line 66 through col. 12, line 10; see also incident light ray L2 and reflected light ray L3 in Figure 4B).

As to claim 12, Kaifu discloses in Figures 3, 4A, and 4B, a semiconductor device comprising: a pixel portion, D11, having an active device, T11, and a pixel electrode comprising a reflecting material, 6, and a light-transmitting material, 5, over an active

Art Unit: 2871

matrix substrate; and a sensor portion, S11, provided over said active matrix substrate, 1; and comprising a photo-electric conversion device, 4, wherein said active device and said pixel electrode and said photo-electric conversion device are provided in one of pixels arranged in matrix, and wherein said sensor portion can read information by utilizing the rays of light transmitting through said light-transmitting material when an external image is read (Abstract), wherein said pixel electrode, 6, has an image display function (col. 11, line 66 through col. 12, line 10; see also incident light ray L2 and reflected light ray L3 in Figure 4B).

As to claim 13, Kaifu discloses in Figure 4B the apparatus according to claim 12, wherein said active device comprises a bottom gate type TFT, T11.

As to claim 19, Kaifu discloses in Figures 3, 4A, and 4B, a semiconductor device comprising: a pixel portion, D11, having an active device, T11, and a pixel electrode comprising a reflecting material, 6, and a light-transmitting material, 5, over an active matrix substrate, 1; and a sensor portion, S11, provided over said active matrix substrate and having a photo-electric conversion device, 4, wherein said active device and said pixel electrode and said photo-electric conversion device are provided in one of pixels arranged in matrix, and wherein at least a part of said photo-electric conversion device, 4, is extended in such a manner as to overlap with said active device, T11, wherein said pixel electrode, 6, has an image display function (col. 11, line 66 through col. 12, line 10; see also incident light ray L2 and reflected light ray L3 in Figure 4B).



***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 3-7, 9, 14-18, 20, 24, 30, 33, and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kaifu in view of Itoh et al (Itoh) USPAT 5,585,817.

As to claim 3, Kaifu discloses the apparatus according to claim 1.

Kaifu does not explicitly disclose the use of a top gate type TFT.

Itoh teaches the use of a top gate TFT, 101, in an integral image recognition/display apparatus in Figure 1 as an art recognized means suitable for the intended purpose of comprising a TFT for improved switching (turning on and off) of the pixel electrodes (MPEP 2144.07) (col. 5, lines 3-11).

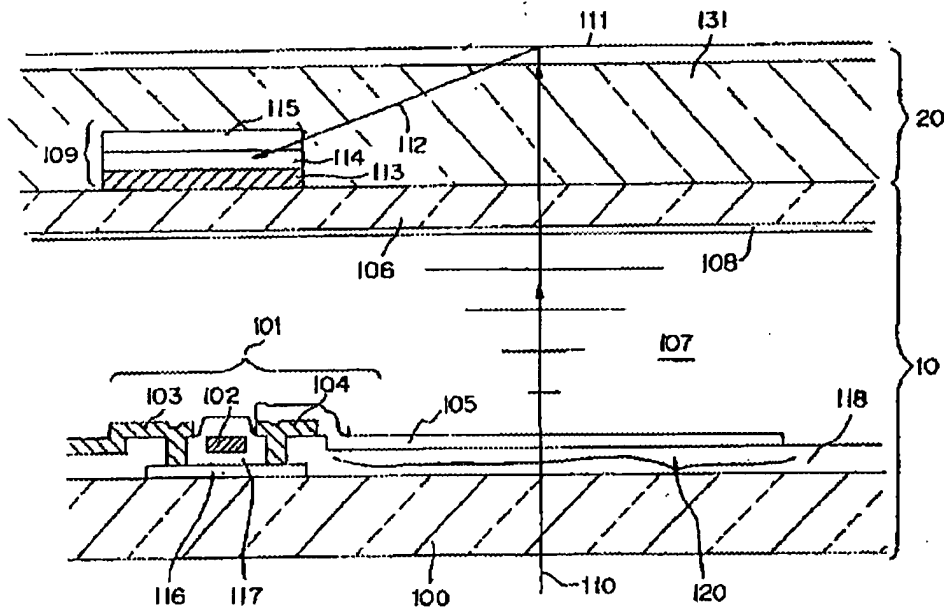


FIG. 1

Itoh is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to add top gate TFTs as an art recognized means suitable for the intended purpose of comprising a TFT for improved switching of the pixel electrodes (col. 5, lines 3-11).

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the integral image recognition/display apparatus of Kaifu with the top gate TFTs of Itoh as an alternate means providing design and manufacturing flexibility for improved switching of the pixel electrodes.

As to claims 4 and 30, Kaifu discloses in Figures 3, 4A, and 4B, an integral image recognition/display apparatus comprising: a plurality of pixel portions, D11, each having an active device, T11, and arranged in matrix and each having a pixel electrode

(left portion in Figure 4B), comprising a reflecting material, 6, and a light-transmitting material, 5, over an active matrix substrate, 1, wherein said pixel electrode, 6, has an image display function (col. 11, line 66 through col. 12, line 10; see also incident light ray L2 and reflected light ray L3 in Figure 4B), wherein said pixel electrode, 6, has an image display function (col. 11, line 66 through col. 12, line 10; see also incident light ray L2 and reflected light ray L3 in Figure 4B).

Kaifu does not explicitly disclose a plurality of sensor portions disposed in matrix over an opposed substrate constituting a display panel, wherein said sensor portion has a photo-electric conversion device, and can read information by utilizing the rays of light transmitting through said light-transmitting material when an external image is read.

Itoh teaches in Figure 1 the use of a plurality of sensor portions, 109, disposed in matrix over an opposed substrate, 106, constituting a display panel, wherein said sensor portion has a photo-electric conversion device (col. 4, lines 36-42), and can read information by utilizing the rays of light, 110, transmitting through said light-transmitting material when an external image, 111, is read.

Itoh is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to add photo-electric conversion devices to the opposed substrate to improve contrast (col. 4, lines 56-60).

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the integral image recognition/display apparatus of Kaifu with photo-electric conversion devices on the opposed substrate of Itoh to improve contrast for superior image display.

As to claim 5, Kaifu discloses the invention of a full color device (col. 19, lines 41-47).

Kaifu in view of Itoh does not explicitly disclose color filters disposed on the opposed substrate. However, the use of color filters on the opposed substrate is one of the most common configurations in the art of liquid crystals to simplify manufacture.

Kaifu is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to add color filters to the opposed substrate to facilitate a full color display.

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the integral image recognition/display apparatus of Kaifu in view of Itoh with the color filters of Kaifu to provide a full color display.

As to claim 6, Kaifu discloses in Figure 4B the use of a bottom gate type TFT, T11.

As to claims 7, 9, 14, 18, and 20, Kaifu discloses the apparatus above.

Kaifu does not explicitly disclose the use of a top gate type TFT.

Itoh teaches the use of a top gate TFT, 101, in an integral image recognition/display apparatus in Figure 1 as an art recognized means suitable for the

intended purpose of comprising a TFT for improved switching (turning on and off) of the pixel electrodes (MPEP 2144.07) (col. 5, lines 3-11).

Itoh is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to add top gate TFTs as an art recognized means suitable for the intended purpose of comprising a TFT for improved switching of the pixel electrodes (col. 5, lines 3-11).

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the integral image recognition/display apparatus of Kaifu with the top gate TFTs of Itoh as an alternate means providing design and manufacturing flexibility for improved switching of the pixel electrodes.

As to claims 15, 24, 33, and 36, Kaifu discloses in Figures 3, 4A, and 4B, a semiconductor device comprising: an active matrix substrate, 1, and an opposed substrate, 84; a pixel portion having an active device, T11, and a pixel electrode comprising a reflecting material, 6, and a light-transmitting material, 5, over said active matrix substrate wherein said pixel electrode, 6, has an image display function (col. 11, line 66 through col. 12, line 10; see also incident light ray L2 and reflected light ray L3 in Figure 4B), wherein said pixel electrode, 6, has an image display function (col. 11, line 66 through col. 12, line 10; see also incident light ray L2 and reflected light ray L3 in Figure 4B).

Kaifu does not explicitly disclose a sensor portion provided over said opposed substrate and comprising a photo-electric conversion device, wherein said active device and said pixel electrode and said photo-electric conversion device are provided in one of pixels arranged in matrix, (*wherein said active device and said pixel electrode and said photo-electric conversion device are provided in one of pixels arranged in matrix,*) and wherein said sensor portion can read information by utilizing the rays of light transmitting through said light-transmitting material when an external image is read.

Itoh teaches in Figure 1 the use of a plurality of sensor portions, 109, disposed in matrix over an opposed substrate, 106, constituting a display panel, wherein said sensor portion has a photo-electric conversion device (col. 4, lines 36-42), and can read information by utilizing the rays of light, 110, transmitting through said light-transmitting material when an external image, 111, is read.

Itoh is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to add photo-electric conversion devices to the opposed substrate to improve contrast (col. 4, lines 56-60).

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the integral image recognition/display apparatus of Kaifu with photo-electric conversion devices on the opposed substrate of Itoh to improve contrast for superior image display.

As to claim 16, Kaifu discloses the invention of a full color device (col. 19, lines 41-47).

Kaifu in view of Itoh does not explicitly disclose color filters disposed on the opposed substrate. However, the use of color filters on the opposed substrate is one of the most common configurations in the art of liquid crystals to simplify manufacture.

Kaifu is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to add color filters to the opposed substrate to facilitate a full color display.

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the integral image recognition/display apparatus of Kaifu in view of Itoh with the color filters of Kaifu to comprise a full color display.

As to claim 17, Kaifu discloses in Figure 4B the use of a bottom gate type TFT, T11.

***Allowable Subject Matter***

4. Claims 10, 11, 21, and 22 are allowed.

The following is a statement of reasons for the indication of allowable subject matter:

As to claims 10 and 21, relevant prior art of record did not disclose, alone or in combination, a device as claimed comprising: *"an insulation film provided over said*

Art Unit: 2871

*upper electrode; and a pixel electrode provided over said insulation film and connected with one of a source region and a drain region of said transistor; wherein said pixel electrode overlaps with said upper electrode with said insulation film therebetween to provide a capacitance.* The closest reference is Kaifu, but Kaifu does not disclose a pixel electrode separated from the upper electrode by an insulating film.

As to claims 11 and 22, they are dependant upon claims with allowable subject matter above.

### ***Response to Arguments***

5. Applicant's arguments filed on 02 December 2003 have been fully considered but they are not persuasive.

#### **Applicant's ONLY arguments are as follows:**

Kaifu does not disclose an apparatus wherein said pixel electrode comprises a reflecting material, 6, in said first display region, and wherein said pixel electrode comprises a light-transmitting material, 5, in said second display region.

#### **Examiner's responses to Applicant's ONLY arguments are as follows:**

It is respectfully pointed out that Kaifu discloses the removal (col. 7, lines 12-22) of a portion of the reflective aluminum electrode, 6, as may be found in Figures 11A and 11B (Applicant's wherein a plane parallel to a direction of said matrix is divided into at



least a first display region and a second display region in said pixel electrode, wherein said pixel electrode comprises a reflecting material, 6, in said first display region, and wherein said pixel electrode comprises a light-transmitting material, 5, in said second display region). Please note: said pixel electrode, 6, has an image display function (col. 11, line 66 through col. 12, line 10; see also incident light ray L2 and reflected light ray L3 in Figure 4B). The difference between the embodiment of Figure 11B and that of Figures 4B is 11B performs the image input and display on the top side as opposed to 4B performing the image input on the bottom side and the image display on the top side. Please also note: 11B energizes pixel electrode, 6, for image display which also necessarily energizes transparent n-type silicon structure, 5, that functions as a transparent pixel electrode in the display mode.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Timothy L Rude whose telephone number is (571) 272-2301. The examiner can normally be reached on Monday through Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert H Kim can be reached on (571) 272-2293. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



tlr

Timothy L Rude  
Examiner  
Art Unit 2871



ROBERT H. KIM  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800